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THE EFFECT OF THE CARBON AND ENVIRONMENTAL PERFORMANCE ON SUSTAINABILITY REPORT

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Abstract. The sustainability report contains information that can help investors predict the company's future ability with its stakeholders' support. This study explains the effect of the carbon performance and environmental performance on sustainability report with financial performance as an intervening variable. The population of this research comprised mining companies listed on the Indonesia stock exchange in 2015-2019. The total samples obtained are 80 companies for five years. All data related to the research variables were processed using the structural equation modelling (SEM-WarpPLS) method. The results of this study indicated that carbon performance had a positive effect on financial performance. Meanwhile, the environmental performance had a negative effect on financial performance. On the other hand, carbon performance and environmental performance did not affect the sustainability report. Financial performance variables could not mediate the variables of carbon performance and environmental performance on the sustainability report.

Keywords: Carbon performance, environmental performance, financial performance, sustainability report

Introduction

In this developing era, starting with the government, company shareholders, and the community have begun to realize the importance of protecting the environment. Companies are required to pay attention to the impact of operational activities to achieve optimal profitability. Three things can guarantee the long-term sustainability of a company's business, namely economic, environmental and social. By applying the principle of sustainability, it can encourage company growth and the sustainability of natural resources. As a result, today, many companies make sustainability reports.

A sustainability report is a company practice by making reports that integrate

financial, environmental and social performance (Bhatia & Tuli, 2017). As a proxy for sustainable business, the sustainability report helps the company to set goals, measure company performance, and manage any changes to ensure the company's operations are sustainable. Companies that have direct activities with the environment and affect nature are mining companies. Mining companies get a lot of attention from the public because their operations take many agricultural products that are difficult to renew. However, mining companies contribute a lot of revenue to the country.

This sustainability report has become a significant development issue for the

company. The issues related to sustainability arise because of the community's demands and expectations regarding the company's role in society. It has happened in various parts of the world, such as Bhopal (India), Chernobyl (Soviet Union), Minamata (Japan), Shell (Nigeria), and even happened in Indonesia. Public demands in Indonesia are in oil and gas companies such as Lapindo Brantas Inc, which caused a flood of hot mud. Furthermore, several environmental problems occur in Indonesia, for instance, the conflict between the Aceh people and Exxon Mobil, which manages natural gas in Aruan. The other one is the mining problem of PT. Freeport in Papua because of the tribal community's empowerment. Indonesia already has several Government Regulations, including Law Number 23 the Year 1997, which regulates the environment, Law Number 44 Article 66 paragraph 2 and Article 74 the Year 2007 regarding corporate obligations in social responsibility. However, several mining companies have not yet made sustainability reports because they think this sustainability report is voluntary. Several factors affect the sustainability report, including carbon performance, environmental performance, and financial performance.

Carbon performance is a form of a company effort to reduce greenhouse gas emissions (Ganda, 2018). Currently, companies are more likely to pay attention to the environment and increase the company's profitability. Companies in Indonesia have committed to reducing 26% or approximately 0.67 gigatons of carbon emissions by 2020. This effort reflects that better carbon performance can attract investors to invest in companies that can increase their profitability. Thus carbon performance can improve financial performance (Ganda, 2018; Yu, V.F. and Ting, 2012) and sustainability report (Luo, 2017; Rahman et al., 2014). On the other

hand, carbon performance degrades financial performance, (Liu, et al., 2016) and it doesn't even affect the sustainability report (Freedman & Jaggi, 2011; Kim, E. H., & Lyon, 2011).

Environmental performance is the company management's attempt to create a harmonious and balanced environment that will build a good image in stakeholders' eyes (Connors, et al., 2011). Companies with good environmental performance will receive a positive response from shareholders through annual reports and sustainability reports published by the company. An increase in environmental performance has an impact on improving financial performance and sustainability reports. It is because investors start to see social responsibility and the company's concern for its surrounding environment. The better the environmental performance of the company, the financial performance will be better (Manrique, S. and Ballester, 2017; Shakil et al., 2019; Sudha, 2020; Tuan, 2012) and have a good impact on the company's sustainability report (Connors, et al., 2011; Simoni et al., 2020). Thus, the company's revenue and the efficiency of environmental costs will boost the company's profitability. Unfortunately, environmental performance can also degrade financial performance (Lioui & Sharma, 2012; Malavizhi, P., & Matta, 2016), because it is related to the costs incurred by the company and degrading the company's sustainability report (Lin, et al., 2014). Even environmental performance does not affect the sustainability report (Burhan, A. H., & Rahmanti, 2012).

Financial performance is a measure used by companies to measure the level of success. It is related to the achieved profits in a certain period which refers to the standards or policies that have been previously set (Galant, A, & Cadez, 2017). The higher the company's profit, it is

expected that the higher the rate of return to investors will be (Moera, D., & Poggi, 2017) consequently, better the company's financial performance will increase the sustainability report disclosure published by the company (Bénabou, R and Tirole, 2010). On the other hand,, (Meng et al., 2014) stated that financial performance has a negative effect on the sustainability report because companies with high profits will only focus on increasing profits.

The previous studies' inconsistency made the author interested in analyzing and testing the effect of carbon performance and environmental performance on sustainability reports with financial performance as an intervening variable empirically. This research's novelty is a research model that examines the role of financial performance in mediating the effect of carbon performance and environmental performance on sustainability reports, especially in mining companies of Indonesia. This research is expected to contribute both theoretically and practically. Theoretically, this research is expected to reference further research and support the theory of legitimacy and stakeholder. Carbon performance and environmental performance can reduce the legitimacy gap because the companies report sustainability well. This social activity is a form of compliance and responsibility of company owners for stakeholders' trust to maintain and share with the environment.

In practical terms, this research can contribute (1) to mining companies; it is expected that all of the company's operational activities are based on concern for the environment. Consequently, the company gets legitimacy from investors and going concern in the future; (2) to regulators; it provides empirical facts about the effectiveness of environmental policies. It regards the importance of carbon performance and environmental

performance in improving the quality of sustainability reports; and (3) to investors; it can be a reference for investment considerations.

Literature Review and Hypothesis Development

Regarding sustainability reports, legitimacy theory views the community, government, individuals and community groups as a form of company's responsibility for the surrounding environment (Deegan, 2002). Accordingly, the company in implementing legitimacy emphasizes the alignment of social values and norms. Thus the environment can accept the company, and it can maintain the company's existence. Meanwhile, stakeholder theory states that companies in conducting their activities are not only for profit but for stakeholder-related interests (Gray et al., 1996; Gray, 1995). Therefore, it is expected that through the company's stakeholder theory in carrying out operations, planning and decision-making activities, the company's management can incorporate normality values. Consequently, the company needs to provide a particular position for stakeholders. All decisions and support provided by stakeholders can improve performance and achieve the company's goals.

Carbon Performance, Financial Performance and Sustainability Report

Companies with good carbon performance have an incentive to differentiate themselves from other companies with poor carbon performance. (Clarkson et al., 2008) added that the company is motivated to maintain and provide information to the public about improving carbon performance. It shows that they care for the environment, investors and result in voluntary disclosures to gain legitimacy. Besides, with good carbon performance, the company has high

credibility and difficult to imitate by other companies. The better the carbon performance of a company, the better the company's financial performance (Ganda, 2018; Yu, V.F. and Ting, 2012) and sustainability report (Luo, 2017; Rahman et al., 2014).

H1: carbon performance has a positive effect on financial performance

H3: carbon performance has a positive effect on the sustainability report

Environmental Performance, Financial Performance and Sustainability Report

Companies that include environmental performance in the annual report will be well responded to by investors. It aims to obtain estimations of future profits, dividends, and risks (Tuan, 2012). Thus, companies that care about the environment and have good environmental performance will legitimize society as a development strategy. In conclusion, environmental performance can improve the company's financial performance (Manrique, S. and Ballester, 2017; Shakil et al., 2019; Sudha, 2020; Tuan, 2012) and sustainability report (Burhan, A. H., & Rahmanti, 2012; Connors, E. &, Connors, E., & Gao, 2011; Simoni et al., 2020). In other words, companies with an environmental strategy in carrying out their operations will contribute to environmental performance through sustainability report (Yadav et al., 2016). A

better company's strategy concerning the environment results in a better environmental performance. It also can improve the sustainability report disclosed the company.

H2: environmental performance has a positive effect on financial performance

H4: environmental performance has a positive effect on the sustainability report

Financial Performance and Sustainability Report

In addition to carbon performance and environmental performance, financial performance is also capable of supporting sustainability reports. Companies with high profits will reflect the higher information reported by the manager. In gaining legitimacy, the management wants to convince investors that the company's performance is good. Furthermore, the management will provide good prospects so that the company's management discloses more information in the sustainability report when there is an increase in company's profits. (Moera, D., & Poggi, 2017) explained that financial performance has a positive effect on the sustainability report.

H5: financial performance has a positive effect on the sustainability report

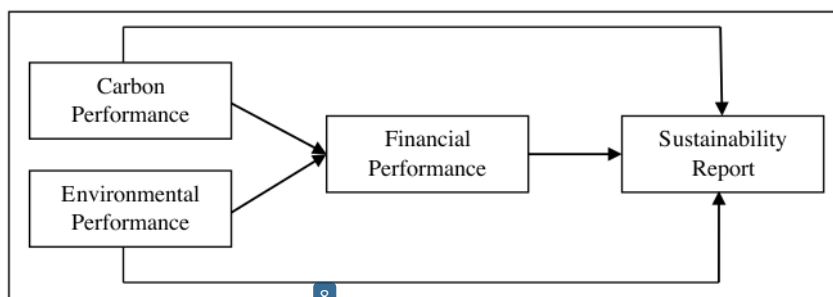


Figure 1. Research Model

Research Methods

The population in this research comprised all mining companies in Indonesia in 2015-2019. The sample selection used a purposive sampling method with the following criteria: (1) mining companies that published an annual report every year in rupiah, (2) mining companies that published sustainability reports, (3) mining companies that presented complete data regarding the research variables. The total sample obtained was 80 mining companies (16 mining companies x 5 years) based on these criteria.

The carbon performance was measured using the natural logarithm of carbon emission intensity (lnCEI). The study used this measurement because it is relatively more objective quantitatively (Luo, 2017). Environmental performance was measured using a dummy variable, namely the PROPER rating by the Indonesian Ministry of Environment. PROPER rating is divided into five colours: gold with 5 points, green colour with 4 points, blue colour with 3 points, red colour with 2 points, and black colour with 1 point. Meanwhile, the return on assets used to measure a company's financial performance (Buallay, et al., 2017; Esteban-Sanc, et al., 2017; Shakil et al., 2019). ROA is the ratio of net income to total assets. It measures the return on total assets (ROA) after interest and taxes (Yuan, et al., 2017). The sustainability report is made by giving a value of 1 for companies that do the sustainability report disclosure and 0 for companies that do not disclose. After assessing all items, the scores are added and divided by the number of items expected to obtain each company's overall score.

The data analysis technique used in this research was structural equation modelling (SEM-WarpPls 3.0) with the following equation:

28

$$\eta_1 = \gamma_1 \xi_1 + \gamma_2 \xi_2 + \zeta_1$$

$$\eta_2 = \beta_1 \eta_1 + \gamma_3 \xi_1 + \gamma_4 \xi_2 + \zeta_2$$

Information:

η_1 : Financial Performance

η_2 : Sustainability Report

γ_1 - γ_4 : Coefficient

ξ_1 : Carbon Performance

ξ_2 : Environmental Performance

ζ_1 - ζ_2 : Residual Value

Result and Discussion

Descriptive Statistic Analysis

The secondary data results in table 1 show that the carbon performance variable has a value between -1,847 to 1,449 with a mean value of 0.174. PT. Timah, Tbk depicted the minimum value in 2018. Meanwhile, PT. Bukit Asam, Tbk depicted the maximum value in 2018. The environmental performance variable has a value between 3,000 and 5,000 with a mean value of 4,000. The minimum value occurred in several mining companies, such as PT. Baramulti Suksessarana, Tbk in 2016 and PT. Indo Tambangraya Megah, Tbk in 2017. On the other hand, the maximum value occurred in several companies, such as PT. Adaro Energi, Tbk in 2015-2019 and PT. Radiant Utama Interinsco, Tbk in 2015-2019. The financial performance variable had a minimum value of -0,989 and a maximum value of 3,277 with a mean value of -0,377. Furthermore, PT. Surya Esa Perkasa, Tbk had the minimum value in 2017, whereas PT. Baramulti Suksessarana, Tbk had its maximum value in 2018. The sustainability report variable obtained a minimum value of -1.449 and a maximum value of 3,377 with a mean value of -0.070. The minimum value happened at PT. Baramulti Suksessarana, Tbk in 2017, PT. Indo Tambangraya Megah, Tbk in 2018 and PT. Medco Energi Internasional, Tbk in 2018. Meanwhile, the maximum value happened at PT. Bukit Asam, Tbk in 2016.

Table 1 below explains the results of descriptive statistical analysis:

Table 1. Statistic Description

	N	Median	Min	Max
Carbon Performance	48	0.174	-1.847	1.449
Environmental Performance	48	4.000	3.000	5.000
Financial Performance	48	-0.377	-0.989	3.277
Sustainability Report	48	-0.070	-1.449	3.377
Valid N				

Measurement Model Results (Outer Model) Convergent Validity and Average Variance Extracted (AVE)

The outer loading output in table 2 shows a value > 0.70. It means, each variable in the study has an excellent

convergent validity value; hence the convergent validity requirements have been fulfilled. Whereas the AVE output results have a value > 0.50. It indicates that the AVE value is good for each construct and has met the requirements.

Table 2. Convergent Validity and Average Variance Extracted (AVE)

	Carbon Performance	Environmental Performance	Financial Performance	Sustainability Report	SE	P Value
lnCEI	1.000	-0.000	-0.000	0.000	0.097	<0.001
PROPER	-0.000	1.000	0.000	-0.000	0.097	<0.001
ROA	-0.000	0.000	1.000	0.000	0.097	<0.001
SRDI	0.000	0.000	0.000	1.000	0.097	<0.001
AVE	1.000	1.000	1.000	1.000		

Discriminant Validity dan Composite Reliability

The test results in table 3 indicate that each construct with its indicator has a higher cross-loading value than other constructs. In other words, the latent construct can predict better by each of the

indicators compared to indicators in other constructs. Further, the value of composite reliability and Cronbach alpha results are more than 0.70, precisely 1.000. Therefore, each latent construct good reliability because it has met the composite reliability and Cronbach alpha test requirements.

Table 3. Cross Loadings, Composite Reliability and Cronbach Alpha

	Carbon Performance	Environmental Performance	Financial Performance	Sustainability Report
LnCEI	1.000	-0.161	0.270	0.099
PROPER	-0.161	1.000	-0.382	0.149
ROA	0.270	-0.382	1.000	-0.250
SRDI	0.099	0.149	-0.250	1.000
Composite Reliability	1.000	1.000	1.000	1.000
Cronbach's Alpha	1.000	1.000	1.000	1.000

Structural Model Test Results (Inner Model) Coefficient of Determination (R^2)

Based on table 4, the R-Square value in the financial performance variable is 0.286 or 28.6%. It shows that the financial performance variable can be explained by the carbon performance and environmental performance variables by 28.6%, whereas

other variables explain 71.4%. Furthermore, the R-Square value on the sustainability report variable is 0.133 or 13.3%. It means that the sustainability report variable can be explained by the carbon performance, environmental performance, and financial performance variables by 13.3% and 86.7% by other variables.

Table 4. R-Square (R^2)

	R-Square	R-Square Adjusted
Financial Performance	0.286	0.254
Sustainability Report	0.133	0.074

Hypothesis Result (t-Test)

The first hypothesis test results show that carbon performance has a significant positive effect on financial performance; hence, **H1 is accepted**. The p-value meets the significance criteria of <0.05 , which is <0.01 . The path coefficients result are 0.158; carbon performance affects financial performance by 15.8%, and other variables influence the remaining 84.2%. Besides, the path coefficient is 0.38, which means that if there is an increase in carbon performance, the financial performance will increase by 0.38. On the other hand, if there is a decrease in carbon performance, the financial performance will decrease by 0.38.

The second hypothesis test results indicate that environmental performance has a significant negative effect on financial performance so that **H2 is rejected**. However, the p-value meets the criteria of the significance of <0.05 , which is <0.01 , and environmental performance affects financial performance by 12.8%. Other variables influence the remaining 87.2%. On the other hand, the path coefficient is -0.33. It means, if there is an increase in environmental performance, then financial performance will decrease by 0.33, and vice

versa if there is a decrease in environmental performance, financial performance will increase by 0.33.

The third hypothesis test results show that carbon performance does not affect the sustainability report; thus, **H3 is rejected**. It is because the p-value is $0.12 > 0.05$ or it does not meet the criteria for significance. Carbon performance through path coefficients has a positive value of 0.007. Accordingly, carbon performance can affect the sustainability report by 0.7%, and other variables influence the remaining 99.3%. The result of the path coefficient is 0.16. If carbon performance increases, the sustainability report will also increase by 0.16. Conversely, if carbon performance has decreased, then sustainability will also decline by 0.16.

The fourth hypothesis test results show that environmental performance does not affect the sustainability report, so **H4 is rejected**. The p-value of $0.31 > 0.05$ means that it does not meet the criteria for significance. Environmental performance positively affects financial performance through path coefficients with a positive value, namely, 0.028. The environmental performance affects the sustainability report

by 2.8%, and other variables influence 97.2%. The path coefficient is 0.07. In other words, every increase in environmental performance will also increase the sustainability report by 0.07, and vice versa if it decreases, it will also decrease by 0.07..

The fifth hypothesis explains that financial performance negatively affects the sustainability report; therefore, **H5 is rejected**. The p-value is 0.01 < 0.05 so that it

has met the criteria for significance. Financial performance affects the sustainability report by 9.7%, and other variables influence 90.3%. Furthermore, the results obtained from the path coefficient are -0.30. It means, if each financial performance increases, the sustainability report will decrease by 0.30, and vice versa if financial performance decreases, the sustainability report will increase by 0.30.

Table 5. Effect sizes for path coefficients

	Carbon Performance	Environmental Performance	Financial Performance	Sustainability Report
ROA	0.158	0.128		
SRDI	0.007	0.028	0.097	

The indirect effect of carbon performance on sustainability reports through financial performance results in path coefficients of 0.018 with a p-value of 0.128.

Table 6. Effect sizes of indirect effects

	Carbon Performance	Environmental Performance	Financial Performance	Sustainability Report
SRDI	0.018	0.016		
P-value	0.128	0.157		

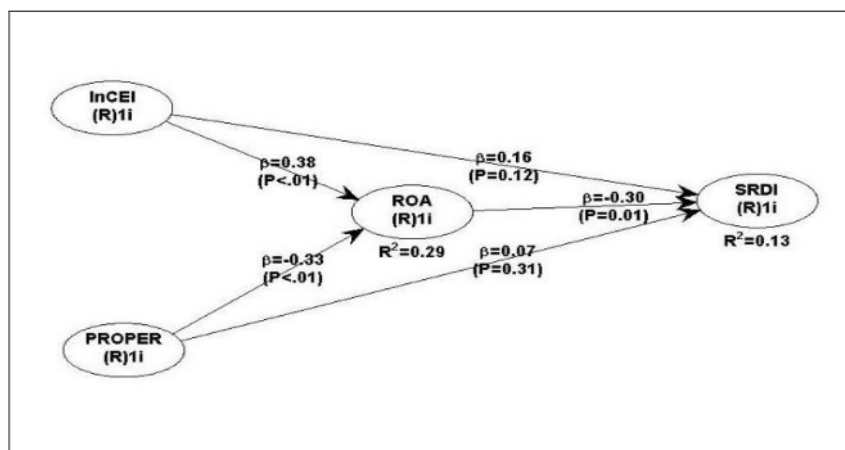


Figure 2. SEM_WrapPLS Result

Carbon Performance and Financial Performance

Carbon performance has a significant positive effect on financial performance. It means that the higher the carbon performance, the higher the financial performance. The results of this study indicate that 80 mining companies care, pay attention to the surrounding environment, and always try to improve the company's carbon performance. The company carries out this effort under stakeholder theory. The activities carried out are for the benefit of stakeholders and get the trust of stakeholders. Additionally, carbon performance is a strategy that the mining company has good credibility with compared to other companies. Therefore, the less carbon released by the company, the company has a controlled carbon performance. They also can generate high profits because it has gained the trust of stakeholders. The high profits reflect the company's financial performance very well. Similar with the research of (Doran & Ryan, 2012; Ganda, 2018; Yu, V.F. and Ting, 2012)(Ganda, 2018; Yu, V.F. and Ting, 2012), carbon performance has a significant positive effect on financial performance. Besides, reducing carbon emissions is one approach in environmental management. (Kumarasiri, J. and Jubb, 2016) thus can influence investment decisions that have a direct impact on the performance of the investment portfolio (Cajias & Piazzolo, 2013). On the other hand (Liu, et al., 2016) proved that carbon performance degrades financial performance because of the benefits resulting from annual asset depreciation and a decline in the stock market (García-Sánchez & Prado-Lorenzo, 2012). (Lee et al., 2013; Menzel, 2010, Smagin, J. and David, 2010) added that there is no relationship between carbon

performance and a company's financial performance.

Environmental Performance and Financial Performance

Environmental performance has a significant negative effect on financial performance. These results indicate that mining companies with high PROPER rating have an impact on financial performance decline. The environmental performance carried out by mining companies is merely aborting the obligations of the environment's policies. As a result, it disrupts the company's legitimacy because it is difficult to get investors' trust to invest in their shares. In addition, environmental performance does not guarantee that it will improve the company's financial performance. The results of this study are consistent with the results of the study (Lioui & Sharma, 2012; Malavizhi, P., & Matta, 2016) that environmental performance has a negative effect on financial performance. Otherwise, (Manrique, S. and Ballester, 2017; Shakil et al., 2019; Sudha, 2020; Tuan, 2012) Mentioned that environmental performance has a significant positive effect on financial performance. High levels of social responsibility disclosure (through broadened environmental practice) are related to increased company share price ((De Klerk, et al., 2015), company image and profitability (Khojastehpour, M. and Johns, 2014; Mishra, S. and Suar, 2013; Yu, V.F. and Ting, 2012) because it offers investors adequate protection.

Carbon Performance and Sustainability Report

Carbon performance does not affect the sustainability report. In other words, mining companies with high or low carbon performance will feel worried about making

disclosures and publishing them in the sustainability report. The company will destroy stakeholders' trust in the company's operational activities that are less efficient when it relates to the environment. The company's concern is they cannot legitimize investors because of the high intensity of carbon emissions. Consequently, the company makes the sustainability report voluntarily. The findings of this research are similar to the results of the study (Freedman & Jaggi, 2009, 2011; Kim, E. H., & Lyon, 2011). They believed that carbon performance does not affect sustainability performance. On the contrary (Luo, 2017; Rahman et al., 2014) believed that carbon performance results have a significant positive effect on the sustainability report..

Environmental Performance and Sustainability Report

Environmental performance does not affect the sustainability report. It implies that mining companies with low or high PROPER rating do not significantly increase the sustainability report. The company's efforts aim to improve environmental performance, such as actively contributing to preserving the environment. The company's efforts have not attracted the stakeholders' attention and legitimacy, so it has not increased the company's sustainability report. This result is following the research of (Burhan, A. H., & Rahmanti, 2012), that environmental performance has no effect on the sustainability report. However, it is in contrast with the study of (Connors, et al., 2011; Simon et al., 2020) which explains that environmental performance has a significant positive effect on increasing the sustainability report. (Lin, et al., 2014) also obtained other results that environmental performance has a negative effect on the company's sustainability report.

Financial Performance and Sustainability Report

Financial performance has a significant negative effect on sustainability reports. It signifies that financial performance cannot be a mechanism for increasing sustainability reports. The increase in the company's profit through return on assets does not provide an overview and indication of investors to invest in the company. There is no guarantee that the number of investors who believe and invest will increase the company's profits. Thus the mining company has high financial performance, and the company does not necessarily make a sustainability report because sustainability reports are still voluntary. This research result supports the research of (Meng et al., 2014) who proved that financial performance has a negative effect on sustainability reports. On the contrary (Bera, D., & Poggi, 2017) concluded that financial performance has a significant positive impact on sustainability reports.

Indirect Effect

The indirect effect shows that financial performance does not mediate the impact between carbon performance and environmental performance on the sustainability report. It is because the emissions issued by the company prevent the company's profit from increasing. Further, mining companies tend not to increase their consistency in making the reportability. Mining companies also tend to spend more to improve the environment for operational activities carried out so that the costs incurred make it difficult for the company to obtain profitability. As a result, financial performance cannot provide good prospects for the company's sustainability report.

Conclusion

This study shows that carbon performance has a positive effect on financial performance. Meanwhile, the environmental performance has a negative effect on financial performance. Furthermore, carbon performance and environmental performance did not affect the sustainability report. However, the financial performance variable has a significant negative effect on the sustainability report. There is no indirect effect between carbon performance and environmental performance on sustainability reports through financial performance. It implies that the financial performance variable cannot mediate carbon performance and environmental performance on the sustainability report.

The contributions of this research are: (1) mining companies always base all operational activities of the company with care for the surrounding environment, so that there is a good balance of nature; (2) provide empirical evidence to regulators on the effectiveness of environmental policies; and (3) can be used as decision making by investors related to investment.

This study has several limitations, including the independent variable's ability to explain the dependent variable, which was still below 50%. Therefore, further research could add to the research sample and extend the observation period. It can also add independent variables such as good corporate governance mechanisms and intervening variables such as company characteristics (size and leverage).

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